

**UNITED STATES PATENT APPLICATION**

**OF**

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**FOR**

**MEDICAL INSTRUMENT WASHER**

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## BACKGROUND OF THE INVENTION

### Field of the Invention

[001] The present invention relates to a medical instrument washer, and more particularly, to a flow passage of a medical instrument washer.

### Background of the Related Art

[002] Referring to FIG. 1, a related art medical instrument washer is, in general, provided with a body 1 divided into a washing tub 2, and a pump room 3, an upper rack 4, and a lower rack 5 drawably fitted in the washing tub, an upper spray arm 4a in a lower part of the upper rack for spraying washing water toward the upper rack, an extension tube 4b vertically disposed in an upper part of the upper rack having one end connected to the upper spray arm for supplying washing water to the upper spray arm, and a lower spray arm 5a in a lower part of the lower rack for spraying washing water toward the lower rack. The related art medical instrument washer is also provided with a sump 6 in the pump room 3 for collecting washing water supplied to the washing tub 2, or returned after washing, a washing pump 7 connected to the sump for discharging washing water in the sump to the upper/lower spray arms 4a, and 5a, a first flow passage 8 having one end connected to the washing pump, the other end connected to the other end of the extension tube 4b, and a body part arranged along a rear surface of the washing tub for supplying washing water to the upper spray arm 4a, and a second flow passage 9 having one end connected to the washing pump, the other end connected to the lower spray arm 5a for supplying washing water to the lower spray arm.

[003] The operation of the foregoing medical instrument washer will be explained.

[004] Upon pushing in the upper and/or lower rack into the washing tub 2 after the user sets washing objects (medical instruments) on the upper and/or lower rack, the other end of the extension tube 4b is engaged with the other end of the first flow passage 8. Then, a

door 1a in front part of the body 1 is closed, and a starting button is pressed, to put the medical instrument washer into operation. Then, as water is supplied, and the washing pump 7 comes into operation, the supplied washing water is drawn into the washing pump through the sump 6. By pumping of the washing pump 7, the washing water is pressed to the upper spray arm 4a and the lower spray arm 5a along the first flow passage 8 and the second flow passage 9 respectively, and sprayed through spray nozzles in the spray arms toward the upper/lower racks 4, and 5 respectively, thereby washing the medical instruments.

[005] However, the first flow passage 8 of the related art medical instrument washer is too long with additional extension tube 4b, to cause a excessive pressure loss of the washing water as a quantity of the washing water increases. That is, since one end of the first flow passage 8 starts from the washing pump 7, is lead to the upper part of the washing tub along the rear surface of the washing tub 2, and the other end of the first flow passage 8 is connected to the extension tube 4b located in the upper rack 4 part, loss of washing water quantity and pressure drop caused by the lengthy first flow passage have been problems.

#### SUMMARY OF THE INVENTION

[006] Accordingly, the present invention is directed to a medical instrument washer that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

[007] An object of the present invention is to provide a medical instrument washer, in which a flow passage is improved for reducing loss of washing water quantity, and pressure loss to the maximum.

[008] Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention

will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[009] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, the medical instrument washer includes a rack drawably fitted in a washing tub, for setting washing objects thereon, a flow passage having one end located on a rear side of the washing tub for supplying washing water to the rear side, and a washing duct on the rack having a washing water inlet in rear part thereof so as to be detachably connected to one end of the flow passage as the rack is drawn/pushed in.

[010] It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[011] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention:

In the drawings:

FIG. 1 illustrates a section of a related art medical instrument washer;

FIG. 2 illustrates a section of a medical instrument washer in accordance with a preferred embodiment of the present invention;

FIG. 3 illustrates a perspective view of a washing duct and rack of the present invention;

FIG. 4A illustrates a detail of "A" part in FIG. 2 showing a progress of operation of

key parts of the present invention; and,

FIG. 4b illustrates a detail of “A” part in FIG. 2 showing a completion of operation of key parts of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[012] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Parts of the present invention identical to the related art will be given the same reference symbols.

[013] Referring to FIGS. 2, or 3, the medical instrument washer in accordance with a preferred embodiment of the present invention includes an upper rack 11 drawably fitted in a washing tub 2, for setting washing objects, a flow passage 12 having one end 12a located on a rear side of the washing tub for supplying washing water to the rear side, and a washing duct 13 on the upper rack having a washing water inlet 13a in rear part thereof so as to be detachably connected to one end 12a of the flow passage as the upper rack is drawn/pushed in.

[014] It is preferable that an opening is provided in a front part of the washing tub 2 for draw/push in the upper rack 11, with a door in the opening so that the washing water inlet 13a in the washing duct 13 is pressed onto the one end 12a of the flow passage to make the washing water inlet 13a engaged with the one end 12a by a thrust generated when the upper rack 11 moves backward when the door is closed. Along with this, it is further preferable that there is a rubber member 14 around the washing water inlet 13a for a better sealing of the washing water inlet 13a with the one end 12a of the flow passage when the washing water inlet is connected to the one end 12a of the flow passage. The washing duct 13 may further be provided with an injector nozzle 15 on an upper surface thereof for exclusive washing of endoscopes. The washing duct 13 may have an upper spray arm 16 further connected to a bottom of the washing duct 13 for spraying washing water toward the upper rack 11. It is

preferable that the flow passage 12 has one end 12a located at a rear side of the washing tub 2, and the other end connected to a washing pump 7 fitted below the washing tub.

[015] The process for connecting the flow passage to the washing duct will be explained in detail, with reference to FIGS. 4A, and 4B.

[016] Referring to FIG. 4A, when the user pushes in the upper rack inside of the washing tub 2 after the user sets washing objects (medical instruments) on the upper rack 11, the rubber member 14 around the washing water inlet 13a of the washing duct 13 comes into contact with the one end 12a side of the flow passage. Then, referring to FIG. 4B, upon closing the door 1a, the upper rack 11 is pushed back by a thrust of the door, such that the rubber member 14 around the washing water inlet 13a is pressed onto the one end 12a of the flow passage, to seal the one end 12a, thereby connecting the washing water inlet 13a to the one end 12a of the flow passage.

[017] Referring to FIG. 2, when the door 1a is closed fully, the upper rack 11 is brought into contact with an inside wall of the door 1a to come into a standstill state, sustaining a continuous pressed sealing state of the washing water inlet 13a and the one end 12a of the flow passage. As the process hereafter is similar to the related art, further explanation of the process will be omitted.

[018] It will be apparent to those skilled in the art that various modifications and variations can be made in the medical instrument washer of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

[019] As has been explained, the medical instrument washer of the present invention has the following advantages.

The shortened flow passage permits to reduce loss of washing water quantity and washing water pressure drop to the maximum.

All advantages described in the detailed description of the preferred embodiment of the present invention are inclusive.

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